R13

B.Tech II Year II Semester (R13) Supplementary Examinations December 2016
ELECTRONIC CIRCUITS ANALYSIS & DESIGN
(Common to ECE and EIE)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)
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1 Answer the following: (10 X 02 = 20 Marks)
- (a) Define class AB amplifier.
- (b) Write the advantages of transformer coupling.
- (c) Calculate h_{fe} for short circuit current gain of transistor is 25 at a frequency of 2 MHz, if $f_\beta = 200\ kHz$.
- (d) An amplifier has a value of R_{in} = 4.2 kΩ, A_V = 220 and $\beta = 0.01$. Determine the value of input resistance of the feedback amplifier.
- (e) Write the advantages of negative feedback amplifier.
- (f) A wein-bridge oscillator has a frequency of 500 Hz, if the value of C is 100 pF, determine the value of R.
- (g) Describe the types of heat sinks.
- (h) Explain FET as voltage variable resistor.
- (i) What are the advantages of the double tuning?
- (j) Define the Q – factor in tuned circuits.

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Explain RC-coupled CE transistor stages. Show the middle and low frequency model for one stage. Write the expressions for current gains.

OR

3 With a neat diagram, analyze the complementary Darlington transistor.

UNIT – II

4 Derive the expression for CE short circuit current gain A_i as a function of frequency using hybrid – π model.

OR

5 Write a short note on gain bandwidth product of amplifier and derive the expression on the following:
- (a) Product of voltage.
- (b) Product of current.

UNIT – III

6 What are the different types of negative feedback? Briefly explain how the input and output impedances of an amplifier are affected by the different types of negative feedback.

OR

7 Draw the circuit diagram of current shunt feedback and derive expressions for input and output resistances.

UNIT – IV

8 Draw the push pull power amplifier circuit. Derive the expression for the output current in push amplifier with base current as $I_b = I_{bn}\ \sin(wt)$.

OR

9 Explain the thermal run away, thermal resistance, thermal stability and thermal instability factors.

UNIT – V

10 Derive the expression for quality factor of a single tuned inductively coupled amplifier.

OR

11 What is the importance of stagger tuning? Explain briefly about stagger-tuned amplifier.